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ABSTRACT

A World Wide Web-based course at Winona State University (Minnesota) in the history of modern Germany (1818-1990), offered during the 1997-98 academic year, showcased several teaching innovations. Taught in "studio mode," with a workstation for each student, the course combined seminar discussions with electronic communication via e-mail and listserv. HTML "commentaries" for each class replaced traditional lectures. Most course reading was available online through access to the J-STOR database. Students learned electronic research skills in the process of searching out and analyzing course-related Web sites. This paper begins with an introductory section that lists the advantages of Web-based courses and outlines seven principles for good practice in undergraduate education. The second section discusses course design considerations, including the constructivist themes of active learning, individualization, cooperative learning, critical thinking, contextual learning, and learning to learn. Classroom technology is addressed in the third section. The fourth section describes the course, including links to other Web sites, the ability to access reserve readings, and assignments. Course design and production are covered in the last two sections, including hyperlinks, transition from text-based to HTML format, cost, and faculty role. It is concluded that creation of Web-based courses demands significant effort, but the payoff is great. (AEF)

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German History on the Web: An Experiment in "Studio-Based" Teaching

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Abstract

A web-based course in the history of modern Germany (1818-1990), offered during the 1997/98 academic year, showcased several teaching innovations. Taught in "studio mode," with a workstation for each student, the course combined seminar discussions with electronic communication via e-mail and listserv. HTML "commentaries" for each class replaced traditional lectures. Most couse reading was available online through access to the J-STOR database. Students learned electronic research skills in the procesas of searching out and analyzing course-related Web-sites.

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Introduction

Now that the Web is a common medium for presenting courses and related materials, a wide variety of electronic offerings is available to students on- and off-campus. Courses developed in HTML for a classroom setting are immediately available for distance delivery. The World Lecture Hall lists some 800 Web-based courses, which run the gamut from syllabi and lectures posted in Courier 10-point to fully-illustrated, interactive presentations with multimedia components. Content and appearance are uneven in quality, just as one might expect of ventures that are still experimental. As faculty gain experience with the new medium, their insight is growing sharper. Course design is becoming more sophisticated and interactive learning is receiving close attention. There is now widespread agreement on the advantages of Web-based courses:

- they offer much greater scope for interactive learning
- links to other sites broaden students' perspectives on the subject of their study
- course reading can easily be delivered electronically; copyright adherence is observed
- class time need not be devoted to information delivery, but rather to critical analysis of information provided electronically
- students have anytime, anywhere access to the course (assuming a computer is available)
- seat-time becomes less a measure of student performance than does in-class interaction, listserv activity, e-mail communication
- classroom presentations gain clarity and vigor from the Web-format
- students can interact with course materials with guidance from the instructor, provided each student has access to a computer in the classroom

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- Web-based courses offer an opportunity to combine the best aspects of electronic access to information with the social aspects of face-to-face interaction between student and instructor

Seven Principles for Good Practice in Undergraduate Education

Web-based courses, if properly designed and presented, are consistent with *The Seven Principles for Good Practice in Undergraduate Education.* Home of the Seven Principles Resource Center, Winona State University advocates a commitment to good teaching practices throughout its academic programs. As a result of adopting these principles, Winona State has embraced active learning as the means by which students gain both knowledge and the ability to become life-long learners. Active learning allows students to construct knowledge by exploring, creating, experimenting, manipulating and seeking out experiences that advance their education.

This environment improves retention and prepares students for whatever they choose to do after graduation.

The seven principles are:

1. Good Practice Encourages Student-Faculty Contact

- focuses on promoting interaction between faculty and students
- requires active effort to overcome obstacles such as inappropriate teaching and learning practices, structure and layout of campus buildings
- e.g. electronic communication, via e-mail or listserv, supplements in-class discussion, office visits and scheduled activities

2. Good Practice Encourages Cooperation Among Students

- focuses on enhancing learning through cooperative rather than competitive activities, e.g. group projects, presentations and papers, peer tutoring and teaching
- requires commitment to establishing relationships, collaborative skills, providing for sufficient time on task, giving ample rewards for successful cooperation
- e.g. "tribal culture" among students using similarly-configured laptops from the same manufacturer

3. Good Practice Encourages Active Learning

- focuses on dimensions that enhance the educational experience: frequent writing assignments, debate and discussion, peer teaching, opportunities to conduct research, opportunities to apply critical thinking skills to real and hypothetical situations
- requires a change in how teaching and learning occurs along with a change in the roles of both faculty and students
- e.g. critical analysis of Websites germane to the students' research topic

4. Good Practice Gives Prompt Feedback

- focuses on the benefits of timely feedback as a means of enhancing class interaction, discussion and commentary
- requires continuing effort and communication as students develop the skills that enable learning throughout life
- e.g. prompt and frequent e-mail communication and critique of work submitted electronically; writing assignments can be more extensive and more intensively critiqued, because electronic documents are easily edited

5. Good Practice Emphasizes Time on Task

- focuses on the relationship between effort and achievement in the teaching/learning arena
- requires new understanding of how much time is spent and also how the time is spent in learning and knowledge construction
- e.g. wide variety of hyperlinks to related information encourages further exploration of the topic; learning can

occur on the student's schedule, rather than the institution's

6. Good Practice Communicates High Expectations

- focuses on students' performance and behavior both inside and outside the classroom
- requires a supportive climate, clear presentation of expectations, tailoring of assignments to individual needs and interests, examples of what constitutes excellent work, regular feedback, tolerance of mistakes, celebration of student success
- e.g. can easily demonstrate, through use of multiple examples, the difference between quality and mediocrity in intellectual products such as Websites

7. Good Practice Respects Diverse Talents and Ways of Learning

- focuses on incorporating diversity into academe as part of preparing students for further education or future employment
- requires institutional goals that adopt a flexible organizational culture, recognizes diversity among students, builds an innovative and imaginative curriculum, establishes a challenging and motivating learning environment
- e.g. Web access to related learning sites around the world

Web-based learning, especially when students have universal access by means of laptop computers, reinforces all Seven Principles. Active, cooperative learning, supported by student-faculty interaction and timely feedback, accommodates a variety of learning styles. Twenty-four hour access to networked course materials and resources encourages students to invest more time and effort in their own education.

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Design Considerations

There are many ways to design and present a Web-based course. One of the Web's great virtues is the flexibility it offers to be creative and to enhance student learning. The main challenges to faculty are technical and environmental: How do I design and present my course in the most effective way? How can classroom architecture affect my teaching for good or ill? Will students respond positively to information technology? Is the investment in technological infrastructure that will be required beyond the means of my campus? We hope to answer these questions by offering the example of a Web-based course in the history of modern Germany (1848-1989).

In addition to these practical questions there is the matter of what are the pedagogical implications of technologically-enhanced, Web-based learning and teaching. Constructivist learning theory provides several themes:

active learning

students no longer assume a passive role but actively construct knowledge by exploring Websites, experimenting with search engines or new ways of seeking information, manipulating things, engaging in discussion of found Websites, seeking out other Websites that complement or contradict, constructing a new knowledge base

individualization

students are able to explore other learning styles and find out what works best for their cognitive abilities

cooperative learning

through peer motivation, involvement and approval, students gain skills in negotiation and team-building besides learning from each other

critical thinking

the WWW provides valuable examples of primary sources and other resources that compel the learner to examine ideas critically and to put them into the context of the topic under discussion

contextual learning

opportunities for gaining better understanding, i.e. increasing the knowledge base, are many as Web sites relating to specific topics can be examined and evaluated

learning to learn

going beyond traditional memorization of facts and fundamentals to the acquisition of learning skills or "Electronic Research Skills," means that students can transfer these skills to other courses and later on to their personal and professional lives

These themes provided us with our "learning objectives." Whether or not we reached them is conjectural, because only the usual performance measures, e.g. essays, exams, class participation are available. Observation suggests that our class of seniors, socialized in an environment different from the one we tried to create, left the course with their intellectual horizons broadened. Once portfolio-based teaching and learning becomes the norm, evidence of cumulative learning will be more reliable.

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The Classroom

The class met in a newly-renovated "studio classroom," designed according to a prototype developed at Rensselaer Polytechnic Institute. The classroom's technology includes:

- 18 high-end computer workstations with network connections
- ATM networking
- course web-server
- a Softboard
- a high-resolution LCD projector
- media server
- MPEG encoder

Rensselaer uses its studio classrooms to teach introductory calculus. We used ours, at least initially, to teach a history course, which was small enough to be conducted as a seminar. Immediate access to a workstation turned out to be useful, since we were able, on several occasions, to work with primary-source documents and critically analyze their contents. Students also learned Electronic Research Skills in the process of ferreting out and critiquing Websites related to the course material under discussion. This activity was especially productive in a class sessions devoted to Holocaust controversies, on which subject there is a variety of relevant sites. As far as the equipment is concerned, the Softboard is a particularly useful device. It performs several functions:

- one can navigate the Internet by using the projected image as a computer touch-screen (students typically preferred this approach when presenting the results of their Internet-research projects)
- if the instructor uses the Softboard as an electronic whiteboard, jottings may be saved to disk at each student workstation, since the Softboard is also networked
- the Softboard can also be used as a simple whiteboard

Special mention of the studio classroom's ATM connection needs to be made. Although ATM technology is expensive and rather fussy to maintain, it has the potential to replace old-style A/V services that rely on analog standards. By means of a media server, linked to ATM routers and switches, full-motion video with simultaneous audio can be sent to any networked computer equipped with an ATM card. The speed of an ATM network is scalable from 155 Mbps to over 600 Mbps, so the bandwidth--even at the low end of the spectrum--is more than adequate to support streaming audio and video. Hyperlinks can easily be embedded in the text of course pages.

Winona State is in the process of expanding its ATM network across the campus, especially to the new library that

is under construction at the moment. Our plan is to provide many access points--in classrooms, residence halls, the library, and elsewhere--for connections to the campus information network. Streaming audio and video, emanating from a broadcast center located in the library, can be received by any computer with an ATM card.

Students at WSU are in the process of acquiring notebook computers through a campus leasing program. During the 1998/99 academic year, already-enrolled students will participate on a voluntary basis. New entering freshmen will be required to lease a laptop computer, probably beginning in the 1999/2000 academic year. In the meantime, the library will provide access to machines with an ATM network connection. At the moment, there are no ATM cards available for notebooks; but they are on the way. As network access expands, students will be able to pursue their Web-based coursework from many points on campus. It will be some time, however, before the phone system can support the bandwidth necessary for off-campus access to full-motion video.

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The Course

We attempted to design a course that would take advantage of, and clearly illustrate, the learning potential inherent in ATM networking applied in a studio-classroom setting. Since none of the students had a laptop computer, but did have regular access to a computer of some sort, we do not specifically address the laptop issue in this presentation.

A course in the history of modern Germany turned out to be a good choice for experimentation, because there is a wealth of valid source material available on the Web. Since the course is constructed in HTML (using WebEdit 2.0, FrontPage '97 , PaintShop Pro 4.0), links to a wide assortment of Web sites could easily be provided. These sources ranged from photo galleries to document collections to other courses in German history that offered a different perspective on the subject.

Students were able to do the following things with a mouse-click:

- pursue biographical details on major historical figures
- follow the course of military campaigns and major battles
- inspect photographic materials
- read and compare primary documentary sources
- pull streaming video off the network/Internet
- pull streaming audio off the network/Internet
- obtain definitions of important terms or concepts

One of the most useful contributions that networking made to the course was access to reserve readings via the Net. WSU is a subscriber to JStor and Project Muse, retrospective databases of full-text articles from major scholarly journals. Especially valuable were the digitized backruns of *American Historical Review and Journal of Modern History*. Access was a bit cumbersome, but generally trouble-free. Because JStor users are authenticated by IP address, the system is available on-campus and via dial-up to the WSU modem pool. Those who access the WSU site via their local Internet Service Provider can be authenticated by enabling Web logins through the campus network software and firewall. Access to other full-text databases, such as FirstSearch, requires password authorization, which can be provided to distance students by the WSU library.

History courses, especially upper-division ones, typically emphasize research and writing assignments. A lengthy research paper is usually due at the end of the semester. We decided that this approach would not work in a Web-based history course, because it overemphasizes traditional information resources found in print collections. We wanted, on the other hand, to encourage student use of the course listserv, e-mail and "electronic reserve" materials. One way of doing so was to replace the term paper with mini-essays due weekly. These essays of about 500 words were based mainly on course reading. Students could read each others' work and comment if they felt like it. No one did, which is mainly the instructor's fault for not encouraging more interaction; he commented privately on each essay. This tactic could have been used more effectively than it was to point out factual errors, stylistic problems, faulty interpretations, and so on. At any rate, students received very timely feedback on their efforts, which is one way of encouraging performance improvement and, one hopes, learning.

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Course Design

There are various ways of producing Web-courses that go beyond pages of 10-point Courier script. We believe this course establishes a kind of design benchmark. Our aim was to provide students with a vehicle by means of which they could explore many facets (e.g. biographical, geographical, artistic, literary) of German history. All information resources were readily accessible, thus obviating the lecture method of teaching. Class sessions became an opportunity to explore the historical by-ways and indulge in interesting digressions. Class commentaries replaced lectures as the primary means of conveying information.

Hyperlinks to biographical information and to related concepts appear throughout each class commentary, which is accompanied by several discussion questions. Students can cover a variety of material in a short time, then link to the readings for that class. Navigation is quick and simple, thus aiding review and, presumably, retention. All materials may be saved to Zip disks.

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Course Production

Since the "commentaries" already existed in word-processed format, the content of the course was essentially established. The course ran over two quarters and occupied some 35 class sessions, with both face-to-face and virtual meetings.

Transition from text-based to basic HTML format took approximately 10 hours to complete. Editing of the commentaries is an ongoing process. It was the Internet research for appropriate links, images, definitions, and documents that occupied the majority of the 250 or so production hours. Embedding the links and images, once located, into specific commentaries consumed about 50 hours. With the course in session, links for each commentary are confirmed in the week before to ensure their viability. New links are added whenever possible and those that are defunct are removed.

Working as a free-lance consultant under contract, Connie Braun produced the course at a total cost of $3,500. As a faculty member at WSU, she is working with about two dozen instructors, to help them achieve similar results. The greatest time investment, however, must come from teaching faculty, who alone can structure their course, write syllabi, and create commentaries. Faculty also have more time than does a fully-occupied administrator to search out Websites and create hyperlinks. Although Connie Braun assists faculty, in her role as Electronic Resources Specialist, she expects them to assume full responsibility for course content. Some faculty, we have learned, do not fully appreciate the division of labor between course design and subject specialist.

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Conclusion

Creation of Web-based courses demands significant "up-front" effort. But the payoff is also great. Not only can such course be offered both in a classroom setting and at a distance, but they can also easily be revised and edited. New materials can be added and less valuable ones deleted. Courses thus become living entities that develop along with the instructor's own knowledge of his/her subject. Best of all, Web-based courses encourage active learning by means of dynamic interaction among students, professor and subject matter. Almost seamlessly, students acquire the electronic research skills that will serve them well long after their formal education ends.

Senior students long used to playing a more passive role in their education find the active-learning approach somewhat disconcerting at first. They are more accustomed to absorbing information than to seeking knowledge actively. New entering freshmen, who perhaps are more open to new learning experiences, may react differently. That is one good reason to introduce Web-based learning and universal laptop access together, as a coordinated means of integrating information technology into the university curriculum.

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